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Typology of Global Production Arrangements [Chapter 2]

Prepared by Task Force on Global Production

Summary

The document is an extract from the draft "Guide to measuring global production", providing a typology of global production arrangements. This typology can be helpful in identifying how much explicit coordination takes place, which can be an indication of how much control (and the associated risk) a lead enterprise has over the production process. This information is required for national accountants and balance of payments compilers to understand the nature of transactions taking place inside global value chains.

The Guide was developed by a Task Force to assist national accounts and balance of payments compilers with recording global production related activities in their accounts. The Task Force is chaired by Ireland and the guide has been edited by the Netherlands.

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I. Introduction

1. This chapter provides a typology of global production arrangements. A typology can be helpful in identifying how much explicit coordination takes place, which can be an indication of how much control (and the associated risk) a lead enterprise has over the production process. This information is required for national accountants and balance of payments compilers to understand the nature of transactions taking place inside global value chains. For each product or asset flow observed inside global value chains, it must be decided whether a transfer of economic ownership takes place. The principles of economic ownership are further explored in Chapters 3 and 4 of the Guide to Measuring Global Production. This chapter discusses the various kinds of economic relationships that may exist between a principal, or leading enterprise, and other units, such as producers on a fee or contract basis (referred to as contractors), participating in the global value chain.

2. The typology presented in this chapter aims to strengthen international comparability by providing guidance to national compilers on the proper breakdown of the activities along the global production chain. However, the analysis of real case examples may be blurred by various arrangements that may be brought together into one global value chain. At the same time, multinational enterprises may rearrange their global production from one day to another. The various country case studies in this Guide to measuring global production illustrate these real life complexities.

3. The following section focuses first on one specific type of global production arrangement, namely those managed by so-called factoryless goods producers (FGPs). The nature of FGPs in terms of their economic activity classification as well as their role in the global value chain requires further examination before introducing the complete typology as presented and illustrated by several numerical examples in Section III. The last section of this chapter winds up with conclusions and recommendations.

II. The classification of factoryless goods producers

4. The recommendations in this section were supported by the Advisory Expert Group on National Accounts (AEG) but the consultation with the UN Expert Group on International Statistical Classifications has not been finalized. Therefore, the proposals in this section are not fully concluded.

5. A traditional manufacturer may use a contractor to provide specialization in a certain type of processing activity to allow the manufacturer to focus on "core" manufacturing activities. Under traditional manufacturing arrangements the ownership of material inputs is a relevant factor in determining whether goods were being produced on own-account or under contract. However, there are a growing number of cases, especially in the production of many high tech products, where the traditional manufacturing arrangement does not hold. A firm may become purely factoryless.

6. The factoryless goods producer (FGP) concentrates on innovation and marketing decisions. While the FGP does not supply material inputs into the production process, the FGP does supply substantial service inputs in the form of technology, know-how, and product design. In addition, the FGP may be monitoring the quality of material inputs through selection or preapproval of certain material input providers. Likewise, the FGP maintains control over the outcome of the production process by providing technical specifications that are essential for the transformation of the material inputs. The FGP controls access and delivery of the final output to consumers.

7. The contractor manages the transformation process by supplying material inputs (according to the specifications of the principal) and transforming them to final products according to the blueprints provided by the FGP. The contractor delivers pre-specified goods to the FGP at pre-determined prices and cannot sell the goods to parties other than the FGP.

8. The transaction that takes place between the contract processor and the FGP cannot be considered a traditional market transaction. A key element in the arrangement between the principal and the contractor is the conditionality of the transaction, which makes the contractor captive. Control over the outcome of the production process and ownership and provision of the intellectual property product (IPP) inputs coincide with the economic ownership of the final output.

9. Case C in the next section and summarized in Table 1 presents the main features of the FGP arrangement. When the FGP does not obtain direct ownership of the material inputs prior to transformation, the industrial classification of the FGP is not straightforward. Paragraphs 140 – 145 of the International Standard Industrial Classification of All Economic Activities, Revision 4 (ISIC, Rev.4) clarify the criteria for classifying a principal that outsources a production process as follows:

> *Outsourcing of parts of the production process*
>
> 140. If only part of the production process is outsourced, the principal is classified to the class that corresponds to the activity representing the complete production process, i.e., it is classified as if it were carrying out the complete process, including the contracted work, itself.
>
> 141. This applies not only to the outsourcing of support functions in the production process, such as accounting or computing activities, but also to the outsourcing of parts of the core production process, such as parts of a manufacturing process.
>
> *Outsourcing of the complete production process*
>
> 142. In general, if the principal outsources the complete production process of a good or service, it is classified as if it were carrying out the production process itself. This applies in particular to all service-producing activities, including construction. In the case of manufacturing, however, the following special considerations apply.
>
> 143. In manufacturing, the principal provides the contractor with the technical specifications of the manufacturing activity to be carried out on the input materials. The input materials (raw materials or intermediate goods) can either be provided (owned) by the principal or not.
>
> 144. A principal who completely outsources the transformation process should be classified into manufacturing if and only if it owns the input materials to the production process—and therefore owns the final output.
>
> 145. A principal who completely outsources the transformation process but does not own the input materials is in fact buying the completed good from the contractor with the intention to re-sell it. Such an activity is classified in section G (wholesale and retail trade), specifically according to the type of sale and the specific type of good sold.

10. A strict interpretation of paragraphs 142 – 145 of ISIC Rev. 4 would mean that a FGP should be classified as a distributor if the FGP does not provide (own) the material inputs subject to processing, even though the FGP provides the technical specifications of the output and owns and supplies other critical inputs. In case the contractor and customers

are situated abroad, the transactions of the FGP would, according to these classification rules, be recorded in accordance with a merchanting arrangement (Case B in Table 1).

11. In many cases, the value of the output of FGPs reflects the contribution of IPP inputs which could be as much or more than that of material inputs. The strict interpretation of ISIC (that the final output of a FGP is simply a distribution activity) does not take into account all the services used in the production process, particularly IPP inputs developed and supplied by the principal. For a contractual relationship where the principal controls the outcome of the processing performed by the contractor (whether de facto or de jure), the latter has an obligation to acquire the output that meets the requirements of the contractual arrangement, and the principal has implicitly accepted the risks and rewards of the contracted work in terms of its outcome. In addition, there are broader issues related to the control of the production process in a contractual relationship between a principal and a contractor that merit further consideration. The FGP does more than simply buying and selling. In particular, the value added by a FGP may be significantly more than the margin associated with the activities of merely distributing a good from a producer to a consumer because the IPP inputs embedded in the good may contribute significant value to the good. In addition, FGPs control the outcome of the production process, and therefore, the nature of their activities differs significantly from distributive activities.

12. Given the increasing prevalence of firms fragmenting their production processes, additional criteria need to be considered when classifying FGPs. Under a factoryless arrangement, the principal generally controls the blueprints of production, access to customers, trademarks, and other sources of significant value embodied in the final output. The contractor generally only manages the processing activities by strictly following the specifications provided by the principal. A key characteristic of the contractual arrangement is the captive nature of the contractor. Processing activities cannot be undertaken without the blueprints provided by the principal. Once processing is finalized according to the conditions of the contract, the contractor is entitled to compensation from the principal, and the output is no longer under the contractor's control. The contractor is not allowed to sell the output to other parties but must sell to the principal.

13. In circumstances where a principal specifies the conditions required to make a particular product and guarantees acquisition of the product from the contractor when the conditions are met, the principal has assumed the economic risks (e.g., product price changes, improved IPP inputs available to competitors, commercial success of the product, etc.) associated with production to a degree sufficient for the principal to be classified as a manufacturer. In this case, a key element in the conditions of the contract between the principal and the contractor is the conditionality of the transaction, which makes the contractor captive. Based on the conditions of the contract, the value added contributed by the contractor does not reflect the full value of the final output because the contractor does not assume the economic risks associated with owning the IPP inputs and controlling the outcome of the production process.

14. While ownership and provision of material inputs is an important consideration, the following additional two criteria are recommended to determine economic ownership of the final output and classification of a FGP:

(a) Control over the outcome of a production process;

(b) Ownership and provision of IPP inputs.

15. Differentiating between various contracts for the purposes of compiling national accounts and international accounts pose practical problems, but a separate subset of existing classifications for FGPs and their transactions would improve the accounts. Central to the subset of existing classifications is the fact that FGPs differ in many respects from (a)

manufacturers that play a more active role in physical transformation and (b) from pure distributors that play a more passive role in production.

III. Typology of global production arrangements

16. After having reviewed the main characteristics of FGPs, the next step is providing a complete typology, including FGPs and other types of arrangements.

17. Global value chains may be set up and managed in various ways. Sometimes the chain follows the organisational structure of a multinational enterprise (MNE). Alternatively the chain may be represented by a number of unaffiliated companies. A principal is usually the organising and controlling company of such arrangements. The unaffiliated contractors may become quite dependent on its relationship with the principal. Under such circumstances the difference between an affiliated and an unaffiliated contractor can be very unclear. The control exerted by a principal on a captive unaffiliated contractor can be practically the same as the control exerted by the MNE parent in a direct investment relationship on its affiliate. One difference is perhaps that unaffiliated contractors may supply their output to more than one principal.

18. Two key features of a dependant relationship are (a) the principal controls the specifications of the output of the contractor and (b) usually plays a leading role in IPP management. Global production arrangements constitute much more than simply a sequence of interlinked markets. As illustrated in figure 1.2, production chains are importantly characterized by the information streams required to connect principals, the lead firms coordinating the tasks, and suppliers. This knowledge aspect of global production chains clearly has a linkage to management of the supply chain and exchange of intellectual property. The principles of ownership and management of intellectual property is further discussed in Chapter 4 of the Guide.

19. This section will focus on several types of global production arrangements where a lead enterprise arranges their particular network of suppliers to produce a given good or service. The typology discusses the different types of global value chains and translates these into the current interpretation of the international standards. In reading this section it will become clear that further consideration may be necessary on some aspects of the various global production arrangements and later chapters of the Guide will address these issues.

20. The main objectives of developing this typology are the following. Firstly, it supports the proper breakdown of economic activities along the global production process on a country-by-country basis. Secondly, it helps in assigning the kind of economic activity of a principal, an enterprise that exerts a certain level of control over the production process, and supplier, contractors, goods producers, and other participating units in the global production process. Thirdly, the typology assists in identifying the economic ownership of inputs, outputs, and intellectual property for the activities along the production process. Fourthly, the typology helps identify the type of output (goods, trade margins, services) of the participating units in the global production arrangement.

21. To better understand the various types of global production arrangements it is useful to look at the entire production process from the viewpoint of the domestic entity involved in the global value chain. For national accounting purposes, it is important to identify the economic activity of each of the participating units in the production chain as well as the value added of each unit. The typology presented in this section uses ISIC, Rev.4 as the industry classification system that groups producing units into detailed industries based on similarities in the economic activity, taking into account the characteristics of the outputs, the inputs and the process and technology of production.

22. To better understand the nature of a production activity and the output it generates, e.g. a good or service, it is also important to identify each entity's involvement in terms of ownership of the material inputs, intellectual property and outputs at each stage of the production process.

23. Table 1 describes global production arrangements for producing goods and services from the viewpoint of the domestic entity and reflects the various combinations of economic ownership of the inputs and outputs in the production process. To address the various boundary issues of global production arrangements, all combinations of economic ownership are discussed. The table also addresses cases where no lead enterprise can be identified.

24. The table indicates the economic engagement between the principal and the supplier in terms of production and does not necessarily designate direct investment relationships. In other words, the supplier may, or may not, be owned by the principal. The table assumes that economic ownership of the materials, the intellectual property, and output can be assigned to either the principal or the supplier. In practice this may be a difficult task. Chapters 3 and 4 of the Guide address the principles of economic ownership of materials and intellectual property, respectively.

25. The identification of the economic ownership of inputs, outputs and intellectual property is not only important for determining the type of economic activity in terms of industry classification of entities engaged in global production but also for the type of output the unit produces (e.g., a trade margin or a manufactured product) and how the international trade flows related to global production should be recorded.

Table 1

Typology of global production arrangements and transactions involved

Production process from point of view of domestic entity	*Entities involved*	*Economic activity*	*ISIC Industry*	*Economic ownership of*			*Type of output*	*International transactions related to production process*
				Materials	*Intellectual Property*	*Output*		
A. "Goods sent for processing abroad"	Domestic (Principal)	Manu-facturing	Manu-facturing	X	X	X	Goods	Record the processing fee as an import of a manufacturing service. Record materials sent for processing as imports of goods if purchased abroad. Exclude materials sent for processing from exports of goods if purchased in the domestic economy. Record the output of manufactured goods as exports of goods if sold abroad. Exclude the output of manufactured goods from imports of goods if sold in the domestic economy.
	Foreign Supplier	Manu-facturing service provider	Manu-facturing				Services	Record processing as exports of manufacturing services.
B. Goods under merchanting	Domestic	Merchanting	Trade			X	Services (Margin on	Record the purchase of a good under merchanting as a negative export, and the

Production process from point of view of domestic entity	*Entities involved*	*Economic activity*	*ISIC Industry*	*Economic ownership of*			*Type of output*	*International transactions related to production process*
				Materials	*Intellectual Property*	*Output*		
							Goods)	subsequent sale as a positive export, of goods. The difference represents the trade margin as output of the merchant. If the physical form of the goods is changed during the period the goods are owned, as a result of manufacturing services performed by other entities, then the goods transactions are recorded under general merchandise rather than merchanting.
	Foreign Supplier	Manu-facturing	Manu-facturing	X	X		Goods	Record the output of the supplier as an export of goods.
C. Factoryless goods production (*recommended treatment*)	Domestic Principal	Factoryless goods production	Manu-facturing, subset factoryless goods producers		X	X	[Goods]	[If output is sold abroad, record the purchase as an import, and the subsequent sale as an export of goods If output is sold in the domestic economy record the purchase as an import of goods.*]
	Foreign Supplier	Manu-facturing	Manu-facturing	x			[Goods]	[Record the output as exports of goods.]
D. Fragmenting part of production of services, IPPs	Domestic (Principal)	Production of services	Appropriate service Industry		X	X	Services	Imports of services (by type). If the principal sells the service abroad, record gross value in exports of services (by type).
	Foreign Supplier	Production of services	Appropriate service Industry				Services	Exports of services (by type).
E. Fragmenting part of production of services, excluding IPPs	Domestic (Principal)	Production of services	Appropriate service Industry			X	Services	Imports of services (by type). If the principal sells the service abroad, record gross value in exports of services (by type).
	Foreign Supplier	Production of services	Appropriate service Industry				Services	Exports of services (by type).
F. Subcontracting production of services	Domestic (Principal)	Purchase and sale of service without any significant transformation of the service between purchase and sale	Appropriate service Industry			X	Services	Imports of services (by type). If the principal sells the service abroad, record gross value in exports of services (by type).
	Foreign Supplier	Production of services	Appropriate service Industry				Services	Exports of services (by type).
G. Direct Investment	Domestic	Financial and business	Section M				Services	None

Production process from point of view of domestic entity	*Entities involved*	*Economic activity*	*ISIC Industry*	*Economic ownership of*			*Type of output*	*International transactions related to production process*
				Materials	*Intellectual Property*	*Output*		
Enterprise not directly engaged in producing goods		services						
	Foreign Supplier	Manu-facturing	Manu-facturing	X	X	X	Goods	Exports of general merch ndise.
H. Direct Investment Enterprise not directly engaged in producing services	Domestic	Financial and business services	Section M				Services	None
	Foreign Supplier	Production of services	Appropriate service Industry	X	X	X	Services	Exports of services.

* The classification of the transaction between the contractor and the FGP (as a good or a service) will be further examined by the Task Force

26. The following subsections provide simple examples of the global production arrangements presented in Table 1. All cases describe global production arrangements where the principal is located in one country and the supplier in another country. All cases are illustrated with the help of an 'athletics shoe manufacturing' example.

A. Case A: Transformation of materials owned by a domestic principal

27. Under this global production arrangement the domestic principal owns the materials and purchases manufacturing services from a foreign supplier to transform the physical inputs into another product. Over the course of the transformation process, the principal maintains economic ownership of the processed raw materials or semi-manufactured goods as well as the goods after processing. This arrangement is also referred to as 'goods sent abroad for processing' (2008 SNA) or 'manufacturing services on physical inputs owned by others' (BPM6).

28. Between the 1993 and 2008 version of the SNA (and BPM5 and BPM6) there has been a fundamental change in the treatment of goods for processing without a change of ownership. According to the former standards (1993 SNA, BPM5), transactions were recommended to be recorded on a cross-border basis, which resembled an imputed change of ownership. Materials were shown as exports of goods when sent abroad by the principal, and then recorded as imports of goods on their return to the principal's territory. The difference between the initial export and subsequent import reflected an implied processing fee. The new guidelines (2008 SNA, BPM6) recommend transactions to be recorded based on a change in economic ownership. As long as the principal retains economic ownership, materials shipped to the processor are no longer recorded as exports of goods by the principal, and goods subsequently returned to the principal's territory are no longer recorded as imports of goods. Likewise, materials purchased by the principal and shipped directly to the processor without entering the principal's territory are recorded as imports by the principal, and the resulting processed good is recorded as an export if it is sold anywhere except the principal's territory. In any case, the processing fee is recorded by the principal as an import of a service and by the processor as an export of a service. Chapter 5 of the UNECE Globalization Guide provides further details.

29. Consider a principal engaged in making athletic shoes. The production of the shoe can be divided into three main parts: (1) the top of the shoe, called the upper; (2) the midsole, the most important part of this athletic shoe because it is the part that cushions and

protects the foot; and (3) the outsole. Suppose the principal created a new innovative design that cushions the foot and provides for better athletic performance. The principal produces the newly designed midsole at its domestic manufacturing plant. However, the principal decides that it is more cost effective to send the midsole and the other materials (the upper and the outsole) it has manufactured to another country for final assembly. There is no change in ownership of the various parts of the shoe sent abroad for further processing. The principal simply pays a processing fee to the supplier to assemble the shoe. The shoe is marketed and sold by the principal, so it owns the output and receives the revenue. The principal may or may not take physical possession of the final output. The output could be shipped directly from the processor to the final buyer in the principal's country; the output could remain in the processor's country; or the output could be shipped directly to another country.

30. The key points of this arrangement are that the supplier only receives a processing fee which is not the full value of the final good but represents the reward for assembling the shoe. The principal is the economic owner of the materials, the intellectual property (the innovative design of the midsole), and the output.

31. Following ISIC Rev.4 both the principal and supplier are classified in the manufacturing industry. The principal reports the revenue it received from selling the shoes at full value as its output. The processor reports only the revenue it received from the contract work (not an imputed value for the shoe) as output of manufacturing services in the production account of the processor.

32. The following numerical examples illustrate this global production arrangement. Let us first discuss the case where the production process required to make the good is entirely carried out by the principal enterprise in country A and is exported to country C. From this starting point, the examples will change slightly using the data supplied in Table 2. This table illustrates the breakdown of the value of the athletic shoe.

Table 2
Breakdown of value of the athletic shoe

Value components	
Material inputs	30
Compensation of production workers	20
Compensation of managers for managing production	2
Other purchased services associated with production of the shoe	3
Return on intellectual property products (IPP)	30
Compensation of sales workers	15
Purchased services associated with selling the shoe	4
Profit on selling the shoe	6
Total	110

1. Athletic shoes example A1

33. The principal maintains two types of establishments in country A, a manufacturing establishment responsible for producing shoes and a wholesale establishment responsible for marketing and selling the shoes. The manufacturing establishment purchases material inputs, such as leather, valued at 30 and transforms the material inputs into the athletic shoes valued at 85. The wholesale establishment sells the shoes to a customer located in

Country C for 110. Table 3 illustrates the production accounts of the manufacturing and wholesale establishments in country A and a further break down of the components of value added of the principal that represents the return to labour in the form of compensation of employees and the return to capital. This latter component includes the capital services (cf. Chapter 20, 2008 SNA) from the intellectual property embedded in the product and the trade margin for selling the good.

Table 3
Example A1 – Production account, country A

	Manufacturing	*Trade*	*Total*
Output	**85**	**25**	**110**
Goods	85	0	85
Services	0	25	25
Intermediate consumption	**33**	**4**	**37**
Materials	30	0	30
Processing services	0	0	0
Other services	3	4	7
Value added	**52**	**21**	**73**
Compensation of employees	22	15	37
Taxes less subsidies on production and imports	0	0	0
Gross operating surplus	30	6	36

The trade balance between countries A and C as presented in Table 4 resembles a very simple picture. The export of shoes from country A to country C equals 110.

Table 4
Example A1 – International transactions

	Country A	*Country C*	*Total*
Export	**110**	**0**	**110**
Goods	110	0	110
Imports	**0**	**110**	**110**
Goods	0	110	110

2. Athletic shoes example A2

34. There are varying degrees of transformation a principal may outsource to contractors. The principal may perform some of the transformation required to make the good or may not perform any of the transformation at all. In the latter case, the principal purchases all the required material inputs to make the good and send those materials to the supplier for final assembly. The following example illustrates the case where the principal purchases all the required material inputs but does not perform any transformation.

35. The principal decides to contract with a supplier in country B to assemble the athletic shoes. The principal in country A purchases the material inputs from a materials supplier in country A and sends those materials to country B for processing. In addition, the principal retains the rights to the intellectual property and instructs the supplier how to

assemble the shoe. The supplier supplies all the production workers required to make the shoe.

36. The principal maintains two types of establishments in country A. The first establishment is responsible for managing the production of the shoes through the use of contractors who transform the materials still owned by the principal. This establishment is according to ISIC Rev.4 classified within manufacturing. The second establishment is a wholesaler responsible for marketing and selling the shoes. The manufacturing establishment pays the supplier in country B a processing fee for assembling the shoe of 20. The wholesale establishment sells the shoes to a customer located in Country C for 110.

37. Table 5 illustrates the production accounts of all related activities in countries A and B. The same hypothetical value components as shown in Table 2 are applicable for illustrating example A2. To keep the example simple, the value added of the supplier is only the compensation of the production workers the supplier hires to assemble the shoe. In addition, there is no assumed efficiency gained from using the contractor to produce the shoe.

Table 5
Example A2 – Production account, countries A and B

	Principal Country A			***Supplier Country B***
	Manufacturing	*Trade*	*Total*	*Manufacturing*
Output	**85**	**25**	**110**	**20**
Goods	85	0	85	0
Services	0	25	25	20
Intermediate consumption	**53**	**4**	**57**	**0**
Materials	30	0	30	0
Processing services	20	0	20	0
Other services	3	4	7	0
Value added	**32**	**21**	**53**	**20**
Compensation of employees	2	15	17	20
Taxes less subsidies on production and imports	0	0	0	0
Gross operating surplus	30	6	36	0

38. Table 6 illustrates the international transactions on a balance of payments basis. Because the merchandise trade statistics are compiled based on customs documents that reflect the physical movement of goods across borders, the merchandise trade data must be adjusted to accord with BPM6 and 2008 SNA concepts. In this example, the materials, such as leather, required to make the athletic shoe are sent from country A to country B without a change in ownership. Therefore, negative adjustments are needed to remove the materials sent from country A to country B because there is no change of ownership. Similarly, the shoes that are sent directly from the processor in country B to the customer located in country C should not be recorded as exports from country B.

39. In addition, since the principal in country A sells the shoes to a customer located in country C without the shoe entering the customs territory of country A positive adjustments

are needed to add the goods sold abroad after processing as exports of country A, to align the transaction to a balance of payments basis.[1]

Table 6
Example A2 – International transactions

	Country A	*Country B*	*Country C*	*Total*
Exports	**110**	**20**	**0**	**130**
Goods	110	0	0	110
Manufacturing services on physical inputs owned by others	0	20	0	20
Imports	**20**	**0**	**110**	**130**
Goods	0	0	110	110
Manufacturing services on physical inputs owned by others	20	0	0	20

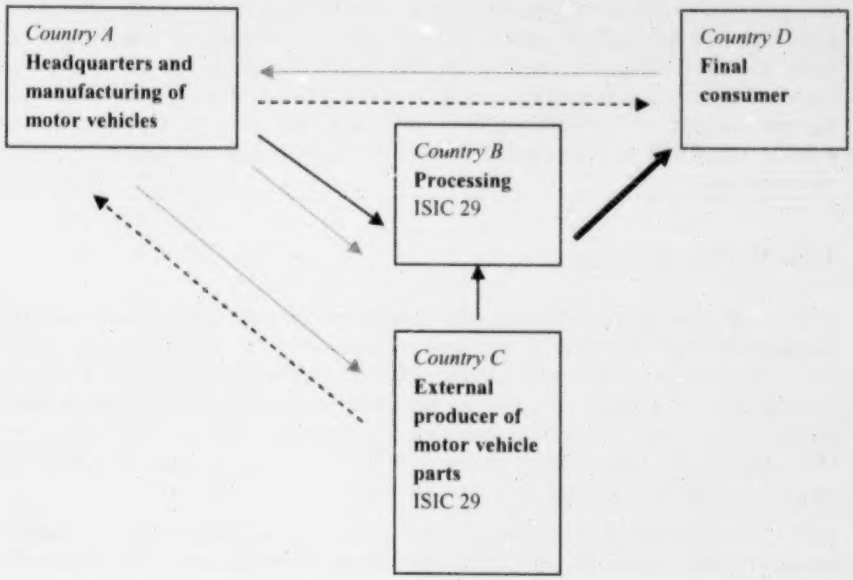
40. Example A2 illustrates the case where the principal purchases all the required material inputs and the supplier does not purchase any of the materials. In some processing arrangements, the supplier may purchase some of the material inputs. It is quite likely that certain intermediate goods will not be delivered by the principal. For example, in the shoe case, glue may be needed to connect the outsole, midsole and the upper. It may happen that this glue is purchased directly by the supplier. Similarly, it is likely that the supplier is charged for housing and energy costs.

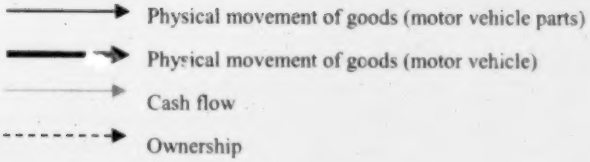
41. BPM6 (par.10.64) states that a manufacturing service fee could include the cost of materials purchased by the processor. No cut-offs are mentioned indicating the amount of material inputs that can be purchased by the supplier and still be included as a case of "manufacturing services on physical inputs owned by others". The same paragraph (10.64) also states that manufacturing services on physical inputs owned by others refer to *all* work done on goods by a resident of one economy for the owner of goods who is resident in another economy. This seems to imply that even substantial amounts of intermediate consumption by the contractor do not change the nature of the arrangement. A key principle in the 2008 SNA and BPM6 is that goods sent abroad for processing will not be recorded as the export of a good, as no transfer of ownership takes place.

[1] For information on reconciliation between merchandise source data and total goods on a balance of payments basis see BPM6 Table 10.

Country case study 2.1

Goods for processing sent to third countries





An MNE in the motor vehicle industry has its headquarters located in country A and foreign affiliates in various different countries. The enterprise manufactures motor vehicle parts, mostly in country A, where the company is classified under ISIC 29: Manufacture of motor vehicles, trailers and semi-trailers. These parts are shipped to country B where the finished product is assembled by a foreign affiliate (also classified under ISIC 29). The headquarters in country A also buys other parts which are needed for the manufacturing of the final product from companies that are not part of the MNE in third countries. These other parts are sent directly to the foreign affiliate in country B.

The finished product is not exported back to country A. In this production process, the headquarters in country A considers itself the owner of the inputs and the intellectual property products until the finished product is sold. In country A's foreign trade statistics, the values of the exported parts are reported without the processing fee and at a much lower value than the finished product. Neither the value of the other parts imported from third countries used in the processing nor the cost of the processing are included as imports in the trade statistics of country A. However, the finished product is invoiced from country A and the full value of the finished product is reported in the business survey as production of motor vehicles. The full value of the finished product includes the profits related to management, design, and R&D carried out in country A and the cost of the processing and parts imported from third countries.

This results in discrepancies when balancing the output and the intermediate consumption with the export and import figures. Since the foreign trade in goods statistics do not collect data according to the change of ownership principle, the NSI in country A need to contact the enterprise to obtain the data regarding the cost of processing in country B and the other parts imported directly from third countries to country B separately. Therefore, the foreign trade and the intermediate consumption figures can be adjusted in such a way that the export of country A reflects the turnover from foreign sales of completed vehicles. Imports and the intermediate consumption of country A include the processing services and the other motor vehicle parts purchased in country C. Care should be taken to also obtain data on inventories abroad.

B. Case B: Merchanting

42. Under this global production arrangement the domestic entity buys the shoe from the supplier and resells it without further transformation. The domestic entity does not provide any of the material inputs or any information to the supplier to help design the shoe. As the domestic entity purchases a good from a supplier abroad and resells that good to a customer located abroad, this activity falls under the "merchanting" case as discussed in the 2008 SNA and BPM6. The domestic entity is simply a trader that buys the shoes from the supplier in country B and sells them to a customer located in country C.

43. The key features of this arrangement are that (a) the goods never enter the domestic entity's territory while the sales are credited to the domestic entity, and (b) the physical form of the goods, while owned by the domestic entity, does not change. In other words, the domestic entity does not carry out any substantial transformation on the purchased goods.

44. In this simple case the domestic entity purchases and resells the goods abroad. The domestic entity did not own the material inputs or the intellectual property, but takes ownership of the shoes before selling them to the customer located in country C. Following the recording principles of merchanting in 2008 SNA and BPM6, the domestic entity's country records a negative export when the good is acquired and a positive export when the good is sold. The difference between the import and export value represents the trade margin received by the merchant. The details of this recording can be found in the Globalization Guide, Chapter 6.

45. Under this scenario the domestic entity is engaged in trading and classified under ISIC 46: 'Wholesale trade, except of motor vehicles and motorcycles'. As mentioned, the output of the domestic entity represents the margin on the sale. The foreign supplier is classified in the manufacturing industry (ISIC section C) and reports the full value of the shoe in its turnover.

46. One significant challenge is the recording of foreign purchases and sales as (negative) exports, as these flows may remain unobserved in merchandise trade statistics of the country where the unit performing the merchanting activities is resident. These measurement challenges are discussed in Chapter 5 of the Guide.

i. Athletic shoes example B

47. Continuing with the athletic shoe example, the domestic entity located in country A purchases the shoe from the supplier located in country B and sells the shoe to a customer located in country C. The shoe does not enter the principal's territory before being sent to country C. The domestic entity, or the principal, in country A is responsible for marketing and selling the shoe but neither controls the production process of the shoe nor owns the material inputs of production. The principal's output is the margin on selling the shoe. The

supplier in country B purchases the materials and receives the returns to the intellectual property embedded in the shoe.

Table 7
Example B1 – Production account, countries A and B

	Principal Country A Trade	Supplier Country B Manufacturing
Gross Output	**25**	**85**
Goods	0	85
Services	25	0
Intermediate inputs	**4**	**33**
Materials	0	30
Processing services	0	0
Other services	4	3
Value added	**21**	**52**
Compensation of employees	15	22
Taxes less subsidies on production	0	0
Gross operating surplus	6	30

48. Table 8 shows that the trade margin (25) represents the difference between goods acquired, and goods sold, under merchanting and is not reported as the export of a service.

Table 8
Example B1 – International transactions

	Country A	*Country B*	*Country C*	*Total*
Exports	**25**	**85**	**0**	**110**
Goods	25	85	0	110
Net exports of goods under merchanting	25	0	0	25
Goods acquired under merchanting	-85	0	0	-85
Goods sold under merchanting	110	0	0	110
Services	0	0	0	0
Imports	**0**	**0**	**110**	**110**
Goods	0	0	110	110
Services	0	0	0	0

49. There are variations in the types of arrangements that fall under merchanting. For example, the good could be bought by the principal located in country A and sold to a customer located in the supplier's country B. If the domestic entity buys the good from the supplier in country B and subsequently sells that good to a customer located in country B then country A would record the transaction as a merchanting transaction (i.e., country A would record a negative export of a good from country B and a positive export of a good to country B). Country B would record an export of a good to country A and an import of a good from country A.

50. There are at least two important borderline cases to consider in the context of merchanting. The first is when the good under ownership of the merchant is subject to

further transformation or processing, which changes the nature of the good. In this case the entity can no longer be considered to be engaged in merchanting. Instead the unit should be treated and classified as a manufacturer. The resulting arrangement has similarities with industrial processing. The distinction between 'goods under merchanting' and 'processing services' is further illustrated in BPM6, Box 10.1.

51. The second borderline case is when the merchanting unit is engaged in the production process by providing the required knowledge such as the blueprints of the production process carried out by the supplier in country B. This case of the so-called FGPs is further explored below.

C. Case C: Factoryless goods producers (FGPs)

52. [This section will be further elaborated upon finalization of the consultation with the UN Expert Group on International Statistical Classifications.]

53. A FGP provides the intellectual property products to the supplier as inputs into the production process. This intellectual property reflects the "blueprints" for production. The recognition that the underlying IPP is part of the transformation process and changes the characteristics of the physical goods reflects a fundamental aspect of production in the 21st century. For example, suppose the principal creates a new and innovative midsole that improves the athletic performance of runners. The principal contracts with a supplier to make the shoe. The principal provides the supplier with the design and the specifications for making the shoe but does not provide any of the required material inputs. The supplier purchases all required materials. However, the principal is responsible for marketing and selling the shoe and receives the revenue. In addition the principal may be involved in identifying key material inputs and monitoring the quality of material inputs as well as being.

54. A FGP controls the delivery of its products to consumers. The supplier delivers predefined products to the principal at predetermined prices and cannot sell its output to parties other than the principal. A FGP may provide substantial inputs in the form of R&D and other intellectual property embedded in the good. These intangible inputs may contribute substantially to the value of the finished product. Because the return on the intellectual property embedded in the good is received by the FGP (and not the supplier) the margin on the sale of the good is higher than purely a trade margin associated with distributing the goods. As seen in Linden et al. (2007) in "iPod" case study, a large part of the wholesale value represents the return on the intellectual property and design.[2]

55. As explained in Section II, determining the output and the industry classification of this type of producer is not straightforward. The recommended treatment in this Guide is to regard FGPs as a special category of manufacturers. The numerical example below follows this recommended interpretation of a FGP arrangement.

1. Athletic shoes example C1

56. Continuing with the athletic shoe example, the principal in country A outsources the transformation of its athletic shoe to a foreign supplier located in country B. The principal controls the production of the shoe by providing the supplier the blueprints of production. The principal maintains ownership of the intellectual property embedded in the shoe as well

[2] Linden, G., K.L. Kraemer, & J. Dedrick (2007) "Who Captures Value in a Global Innovation System? The case of Apple's iPod." UC Irvine: Personal Computing Industry Center (http://escholarship.org/uc/item/1770046n)

as being responsible for marketing and selling the shoe. The supplier purchases the materials (according to the specifications of the principal) and the principal acquires the shoe at the factory gate price *including* the materials plus the value of the processing (compensation of the production workers) but *excluding* any value associated with the use of IPPs in this production process.

57. [The guidance on recording the transactions between the FGP and the contractor will be further elaborated upon finalization of the consultation with the UN Expert Group on International Statistical Classifications.].

Country case study 2.2
Factoryless Semiconductor Producers

This case study originates from a country with a relatively large number of factoryless semiconductor producers. According to the Global Semiconductor Alliance, factoryless semiconductor producers are called "fabless" because "Fabless refers to the business methodology of outsourcing the manufacturing of silicon wafers. Fabless companies focus on the design, development and marketing of their products and form alliances with silicon wafer manufacturers, or foundries." Foundries are typically located in Asia because the generally low cost of labor, so fabless companies can benefit from lower production costs while concentrating their research and development resources on the end market.

In the case study country, referred to as country A, a typical fabless semiconductor enterprise has a management unit and a large R&D unit. During the development of the design, the testing of the semiconductor is performed at the enterprise of a subcontractor, often situated in another country. At later stages the production is also performed by sub-contractors outside the territory of country A.

An example of such a factoryless semiconductor enterprise in the case study country is a fabless enterprise designing and marketing finished products worth about a quarter of a billion dollars, which are produced by non-affiliated enterprises in an Asian country. The income of the domestic enterprise in country A amounts to about 35% of the output value. The share of the domestic enterprise in the combined added value is quite high and may be assumed to reflect mainly the value of R&D performed within country A. In its financial reports the domestic enterprise registers the whole value of the sales of the final production as domestic income, so that on the one hand it is easy to collect many of the gross data needed to analyse all production processes in the global value chain. However, on the other hand, in order to separate the activities between the countries, one has to collect data on the transactions taking place between the domestic enterprise, the producers abroad, and the customers, since no movement of goods has been observed in the foreign trade data, and the transfer of R&D to be used in the outsourced production also has not been recorded.

2. Branding

58. [The guidance on the exact scope of FGP activities will be further elaborated upon finalization of the consultation with the UN Expert Group on International Statistical Classifications.].

59. A FGP could be involved in a combination of activities such as branding and outsourcing the transformation of a good that the firm designed. One such firm, a computer producer, utilizes a significant number of unaffiliated contractors around the world to manufacture products that has been designed by the firm. The firm uses multiple contractors to maintain flexibility in their supply chain and manufacturing process thereby generating cost efficiencies and reducing time to market for own-designed products. In

addition, the computer firm's financial statements indicate the firm also purchases original manufactured products from third-party producers and resell these products under the firm's own-brand name.

60. The stylized arrangements discussed in this section are simplified versions of actual global production arrangements that can be very elaborate. The discussion above illustrates that a firm might use a combination of types of global production arrangements and statistical offices may have difficulty distinguishing between a producer that is only branding products and a producer that provides the blueprints of the production process, thus exhibiting control over the production process. These borderline cases are further examined in Chapter 5 of the Guide.

3. IPP services

61. The intellectual property inputs in global production arrangements may also be provided by entities other than FGPs. For example, companies specialised in R&D may supply their knowledge inputs without being engaged in the production of goods. Suppose an entity creates a new and innovative midsole that improves the athletic performance of runners. The entity sells the rights to use the design and the specifications for making the shoe to a shoe manufacturer which is also responsible for marketing and selling the shoe and receives the revenue. The research and development (R&D) supplier receives revenue from selling or licensing the design and should not be seen as the principal arranging an international supply chain to make a particular good or service. It is simply a participant in the supply chain that is responsible for supplying the intellectual property products.

4. Athletic shoes example C2

62. Continuing with the athletic shoe examples, a unit in country A is transferring the rights to use the design and blueprints of how to make the shoe to a manufacturer in Country B in return for a fee. The manufacturer in Country B transforms the shoe and is responsible for marketing and selling the shoe and records the full value of the shoe in its turnover, including the IPP service fee embedded in the shoe. Tables 11 and 12 show that the company in Country A exports the IPP service fee to Country B. All other production takes place in country B under the full responsibility and ownership of the shoe manufacturer.

Table 11
Example C2 – Production account, countries A and B

	Country A R&D provider	*Country B Manufacturer*
Gross Output	**30**	**110**
Goods	0	110
Services	30	0
Intermediate inputs	**0**	**67**
Materials	0	30
Processing services	0	0
Other services	0	37
Value added	**30**	**43**
Compensation **of employees**	0	37
Taxes **less subsidies** on production and imports	0	
Gross operating surplus	30	6

Table 12
Example C2 – International transactions

	Country A	*Country B*	*Country C*	*Total*
Exports	**30**	**110**	**0**	**140**
Goods	0	110	0	110
Services **(use of intellectual property)**	30	0	0	30
Imports	**0**	**30**	**110**	**140**
Goods	0	0	110	110
Services **(use of intellectual property)**	0	30	0	30

D. Services related global production arrangements

63. Firms may contract with other firms to provide support activities such as billing services or information "helpdesk" services. Contracting these kinds of services is quite common. However, the arrangements presented in this subsection deal with firms whose primary activity is the production of services. These firms may fragment part of their services production to different countries or may even fully outsource, or subcontract, the provision of their services to non-affiliated companies abroad.

64. There is a subtle distinction between fragmenting part of the production and fully outsourcing production. Fragmenting implies that the domestic entity remains in control of the production of the primary service product, and incorporates that part that was fragmented into the product. Full subcontracting of the production of services means that the principal entity acts as a services arranger, who bundles and manages the services of the subcontractor(s) on behalf of customers.[3] The main distinction between these two types of arrangements is whether the domestic entity contributes to the production of the primary service product versus fully subcontracting out the production of the primary service product.

E. Case D: Fragmenting the production of services, Intellectual Property Products (IPPs)

65. In this case, the domestic entity remains in control of the production process and owns the intellectual property used in production, as well as the intellectual property as output of the production process. For example, a software firm in Country A receives a contract to design customized software for another company in country B.[4] The software firm in country A employs computer programmers in-house to write the application, but also employs computer programmers located in country C to develop certain features of its application. The principal, the domestic software firm located in country A, owns the proprietary rights to the software being developed and is simply paying the supplier in country C a fee for providing the service.

66. Both the principal and the supplier are classified in the appropriate service industry. In the case of software development, both the principal and supplier are classified in the ISIC Division 62: Computer programming, consultancy and related activities.

[3] Manual on Statistics of International Trade in Services (MSITS) 2010 paragraph 3.61 – 3.62.

[4] The customer could be located in the domestic entity's country—country A— or be located in the country of the supplier—country B.

F. Case E: Fragmenting part of the production of services, excluding IPPs

67. In this case, the domestic entity remains in control of the production process and owns the output associated with the service produced and no services are related to IPP.

68. For example, an accounting firm in country A receives a contract from a company in country A to audit the company's financial statements. The company has a subsidiary in country B. The domestic accounting firm in country A uses domestic employees to perform auditing services of the unit located in country A. Because in many parts of the world accounting firms are required by law to be locally owned and independent, the accounting firm in country A must contract with another accounting firm in country B, where the subsidiary is located, to perform the auditing service for the subsidiary's financial statements.

69. The accounting firm in country A provides auditing services to the company located in country A and receives the revenue directly from the customer located in country A. However, there is an international transaction involved to account for the purchase of auditing services by the accounting firm in country A from an accounting firm in country B. In this example both the principal and the supplier are classified in ISIC Division 69: Legal and accounting activities industry.

G. Case F: Subcontracting production of services

70. Under this global production arrangement, the principal may outsource (part of) its services provision. Under certain conditions, such an arrangement could be considered in some ways similar to merchanting of goods, particularly when the services are purchased and resold without any significant transformation. The issue of merchanting of services and its relationship to subcontracting is further discussed in Chapter 10 of the Guide.

71. For example, a principal unit is paid to provide custom software services to a non-resident customer. The principal subcontracts to a non-resident contractor to provide the required custom software services. The principal pays the non-resident contractor to obtain ownership of the developed software and subsequently resells this software to the non-resident customer. The principal records the revenue received from the non-resident customer (recorded as exports of software services) and the expenditure for purchasing the custom software from the non-resident contractor (recorded as imports of software services).

72. The value of services exported and imported in the economy of the principal is recorded on a gross basis. This treatment is applicable because the principal buys and sells the services. In case the principal acts on a commission basis (i.e., not taking ownership of the software), then only the commission would be recorded as the service provided by the principal. Both the principal and the supplier are classified in the appropriate service industry of their primary activity, which in this case are ISIC Division 62: Computer programming, consultancy and related activities.

1. Direct investment enterprises, holding companies and head offices

73. The last production arrangements include direct investment enterprises that are themselves not directly engaged in the production of goods or services. Purely direct (foreign) investors are not engaged in production at all. The returns on their investments are recorded as property income (dividends) in the distribution of income accounts. The owners of foreign enterprises may be engaged in the production activities in at least two ways.

74. Head offices (ISIC Rev. 4, section M, class 7010) may oversee and manage the activities of (foreign) subsidiaries by undertaking the strategic or organizational planning and decision making role of the company or enterprise; exercising operational control and manage the day-to-day operations of their related units.

75. Holding companies (ISIC Rev. 4 in section K, class 6420) hold the assets of subsidiary corporations but do not undertake any management activities. They are described as units that hold the assets (owning controlling-levels of equity) of a group of subsidiary corporations and whose principal activity is owning the group. The holding companies in this class do not provide any other service to the enterprises in which the equity is held, i.e. they do not administer or manage other units.

76. Both head offices and holding companies generate output in the form of managerial or financial services. These services are expected to be mostly consumed by the foreign subsidiaries and this may give rise to international transactions, i.e. the export and import of managerial and financial services. In theory these services add up to the other inputs of production of the foreign subsidiaries. In any case the output of the ultimate production process is reported in the country in which the subsidiaries are resident.

IV. Conclusions and recommendations

77. The stylized arrangements discussed and illustrated in this chapter are simplified versions of actual global production arrangements that can be very elaborate. A multinational enterprise can consist of many units producing an array of products across several countries and the accompanying accounting relationships can be complex. In such situations the lines between the various types of production arrangements can become blurred.

78. The main objective of the typology is to support the proper breakdown of economic activities along the global supply chain on a country-by-country basis. Guidance on the recording of each type of global production arrangement is provided in the chapters that follow.

79. The following recommendations can be extracted from the discussions in Chapter 2 of the Guide:

(a) Table 1 should be used as a 'roadmap' to assist the translation of complex real life global production cases into recognisable schemes from which the main accounting principles can be derived. Updating this table may be needed to keep track of newly emerging forms of global production arrangements (particularly in the area of services).

(b) In the case of processing or manufacturing services on physical inputs owned by others (case A), the manufacturing service fee could include (substantial amounts of) cost of materials purchased by the processor. The processing arrangement refers to all processing done by a supplier on goods owned by others.

(c) When a good under ownership of an entity performing a merchanting function is subject to further transformation or processing, which changes the nature of the good, the entity can no longer be considered to be engaged in merchanting. Instead the entity should be treated and classified as a manufacturer. The resulting recording is similar to that of goods for processing.

(d) FGPs control the supply chain, the blueprints of production, access to customers, trademarks, and other sources of significant value embodied in the final output. The contractor generally only manages the processing activities by strictly following the specifications provided by the principal. A key characteristic of the contractual arrangement

is the captive nature of the contractor. The contractor's production activities cannot be undertaken without the blueprints provided by the principal.

The following two criteria are recommended to identify a FGP:

- Control over the outcome of a production process;
- Ownership and provision of IPP inputs.

(e) According to these criteria, the following supplementary guidelines should be used to determine the industry classification of FGPs: A principal that owns, or obtains a license to use, and supplies IPP inputs but no material inputs to a contractor but still manages (controls) the overall outcome of the production process should be classified to the manufacturing industry in a separate subset of existing classifications that highlights the factoryless characteristics of the firm.

(f) A principal that supplies no IPP or other inputs (goods and services) to a contractor should be classified to trade.